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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/270,780	03/17/1999	IKUO HIYAMA	503.36984X00	2934
20457	7590	05/18/2005	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			QI, ZHI QIANG	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/270,780

Applicant(s)

HIYAMA ET AL.

Examiner

Mike Qi

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-8,10-15,17-22,25,26,29,30 and 33-55 is/are pending in the application.
- 4a) Of the above claim(s) 11,19,25,29,33 and 35-55 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3,5-8,10,12-15,17,18,26 and 30 is/are allowed.
- 6) ☒ Claim(s) 20-22 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse in the reply filed on Mar.9, 2005 is acknowledged. The traversal is on the ground(s) that Applicants request reconsideration and withdrawal of the election of different inventions requirement. This is not found persuasive because this application of a liquid crystal display device contains several inventions, even though the claims recite the feature of a reflective polarizer, but the structure of the liquid crystal display device having different subcombinations disclosed as usable together in a single combination in which the subcombination distinct from each other such as different structure of the reflective polarizer; the relationship between the projected light from the illumination device and the thickness of the substrate, etc.; and the structure of the pixel that would need substantially different searches and a clear burden would exist.

The requirement is still deemed proper and is therefore made FINAL.

Claims 11, 19, 25, 29, 33, 35-55 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected claims, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on Mar.9, 2005.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Applicant admitted prior art (AAPA) in view of US 6,025,897 (Weber et al).

Claim 20, AAPA discloses (background of the invention in the specification; conventional liquid crystal display device of Fig. 35) that a liquid crystal display device comprising:

- an illumination device (51,53,54,56);
- a light control element (40) arranged at a projected light side of the illumination device;
- a reflective polarizer (30) arranged at an upper portion of the light control element (40);
- a liquid crystal display element (20) for controlling polarization of projected light projected from the reflective polarizer (30), so that the major axis direction of a pixel being arranged approximately parallel to a direction wherein the linearly polarized light component of the projected light projected from the illumination device (51,53,54,56) is high, in order to obtain maximum light transmittance;
- a screen (10AA) arranged at an upper portion of the liquid crystal display element (Fig.32), and the viewing angle is widened by the screen (10AA) (page 5, lines 5-6);

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- the light control element (40) is the only light control element arranged between the illumination device (51,53,54,56) and the reflective polarizer (30).

AAPA does not explicitly disclose that the polarized light transmission axis of the reflective polarizer is adjusted so as to be substantially perpendicular or substantially parallel to a control axis of the light control element. (Note: the “a control axis of the light control element” can be any light control axis such as the direction of a light reflection, light transmission or light birefringence as long as a light being controlled).

However, Weber discloses (col.9, lines 43-67; Fig.11) that an optical structured layer (113) having structure surface (112) (that is a light control element, because the function is to control light), and a reflective polarizer (116) to make up a brightness enhanced reflective polarizer (110), and the light transmitted by the optical structure layer (113) passes through the reflective polarizer (116) at near normal angles (perpendicular to the reflective polarizer 116), so that is a polarized light transmission axis of the reflective polarizer to be adjusted substantially perpendicular to a control axis of the light control element such as a light transmission axis of the optical structure layer (113), so as to enhance the brightness and to achieve an adequate display contrast. Weber also discloses (col.8, line 44 – col.9, line 27; Figs.9, 10) that the light has a correct polarization to match the transmission axis of the polarizer (rear polarizer of the LCD) so as to make more efficient use of the light made available by optical cavity (140) (illumination device). Therefore, the polarized light transmission axis of the reflective polarizer is parallel to a major axis direction of a pixel, so as to achieve more efficient light usage.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange such reflective polarizer wherein the polarized light transmission axis of the reflective polarizer is adjusted as claimed in claim 20 for achieving maximum light transmittance so as to enhance the brightness and efficient light usage.

3. Claims 21 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Weber as applied to claim 20 above, and further in view of US 5,712,694 (Taira et al).

Claim 21, lacking limitation is such that the illumination device in a liquid crystal display device having a reflector arranged at a rear plane of the illumination device.

However, Taira discloses (col.18, lines 39-63; Fig.21) that an illumination device comprises a reflector (1602) arranged at the rear plane of the light guide (1601) (illumination device). Taira indicates (col.8, lines 18-27) that the light efficiently used as illumination light so as to increase the light utilization efficiency and to improve the display brightness for use in a liquid crystal panel.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange an illumination device having a reflector as claimed in claim 21 for increasing the light utilization efficiency and improving the display brightness.

Claim 34, lacking limitation is such that forming stripes declined planes on the reflector substantially parallel to a major axis direction of a pixel.

However, Taira discloses (Fig.21) that such stripe of a declined planes on the reflector (1602), and the stripes of the reflector parallel to the major axis of the pixel would enhance the reflectance and increase the brightness, and that would have been at least obvious for achieving a higher luminous reflectance.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to form strips declined planes on the reflector as claimed in claim 34 for achieving a higher luminous reflectance so as to improve the display brightness.

4. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Weber as applied to claim 20 above, and further in view of US 5,587,816 (Gunjima et al).

Claim 22, AAPA discloses (page 4, lines 18-22; Fig.32) that the liquid crystal layer (13) is interposed between a pair of transparent substrates (11A,11B) and two polarizers are arranged on either side thereof.

Still lacking limitation is such that using absorption polarizer.

However, Gunjima discloses (col.17, lines 36-67; Fig.1) that a liquid crystal display element using a pair of absorbing type organic polarizing plates (9, 10), so as to provide a maximum transmittance and to increase the contrast ratio.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use a pair of absorption type polarizers as claimed in claim 22 for providing a maximum transmittance and increasing the contrast ratio.

Allowable Subject Matter

5. Claims 1-3, 5-8, 10,12-15, 17-18, 26 and 30 are allowed.
6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither discloses nor teaches that a liquid crystal display device comprises various elements as claimed, more specifically, as the following:

a reflective polarizer comprising a cholesteric layer and a quarter wave plate arranged at an upper portion of the light control element so that a polarized light transmission axis of the reflective polarizer is adjusted so as to be substantially perpendicular or substantially parallel to a direction of stripes of the light control element; and the light control element comprises an isotropic medium having no birefringence as shown in Fig.5 [claims 1 and 13].

The closest references such as AAPA and Weber disclose that a liquid crystal display device having reflective polarizer to enhance the brightness, but the prior art of record do not discloses that adjusting the polarized transmission axis of the reflective polarizer perpendicular or parallel to the direction of strips of the light control element, and the light control element comprised an isotropic medium having no birefringence as claimed in claims 1 and 13 and as shown in Fig.5.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299.

The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi

Mike Qi
Patent Examiner
May 4, 2005